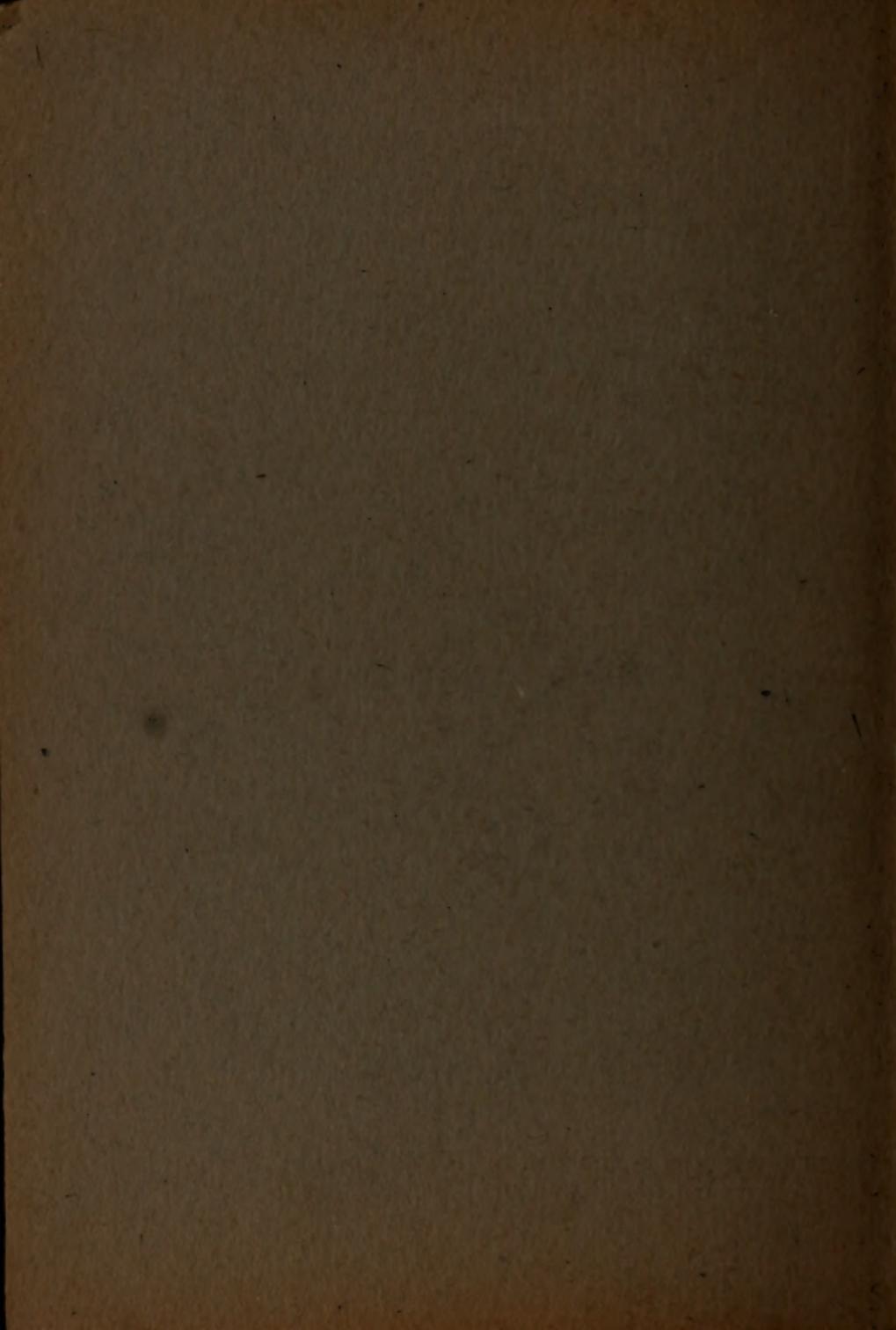


LITTLE BLUE BOOK NO. 443
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The Story of Francis Bacon's Philosophy

Will Durant, Ph.D.



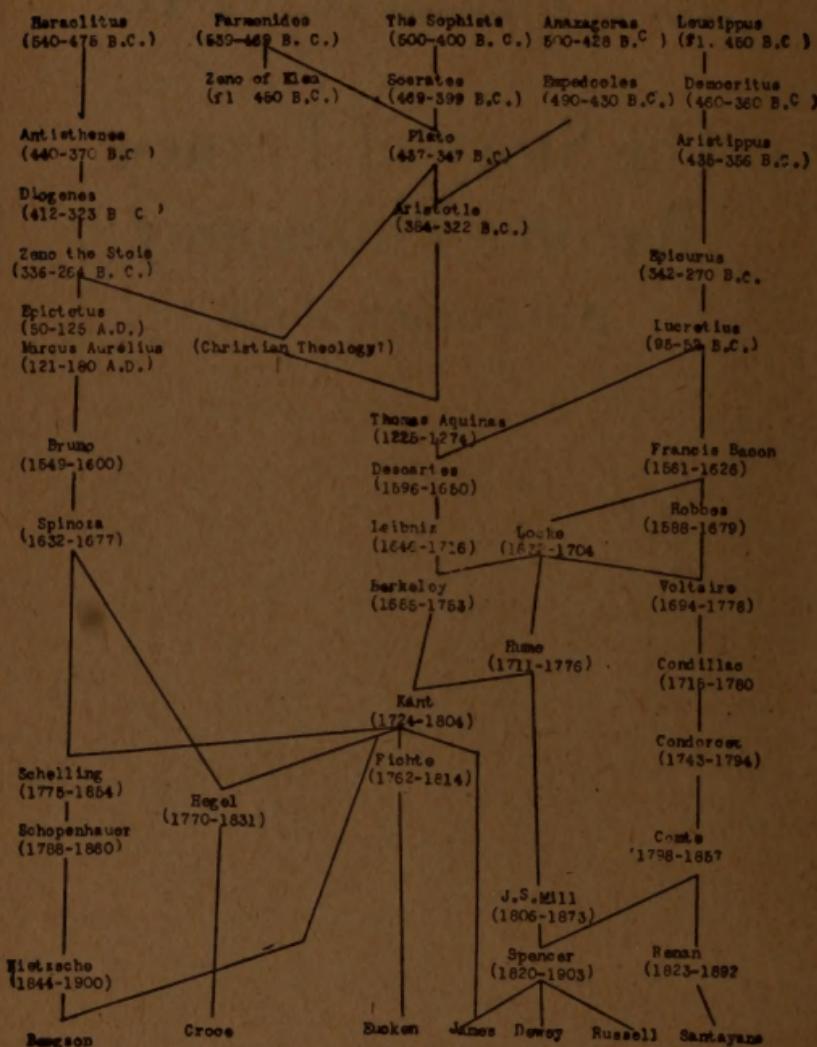
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A TABLE OF PHILOSOPHIC AFFILIATIONS



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THE STORY OF FRANCIS BACON'S PHILOSOPHY

I. FROM ARISTOTLE TO THE RENAISSANCE

When Sparta blockaded and defeated Athens towards the close of the fifth century B. C., political supremacy passed from the mother of Greek philosophy and art, and the vigor and independence of the Athenian mind decayed. When, in 399 B. C., Socrates was put to death, the soul of Athens died with him, lingering only in his proud pupil, Plato. And when Philip of Macedon defeated the Athenians at Chaeronea in 338 B. C., and Alexander burnt the great city of Thebes to the ground three years later, even the ostentatious sparing of Pindar's home could not cover up the fact that Athenian independence, in government and thought, was irrevocably destroyed. The domination of Greek philosophy by the Macedonian Aristotle mirrored the political subjection of Greece by the virile and younger peoples of the north.

The death of Alexander (323 B. C.) quickened this process of decay. The boy-emperor, barbarian though he remained after all of Aristotle's tutoring, had yet learned to revere the rich culture of Greece, and had dreamed of spreading that culture through the Orient in the wake of his victorious armies. The development of Greek commerce, and the multiplication of Greek trading posts, throughout Asia Minor had provided an economic basis for the unification of this region as part of an Hellenic empire; and Alexander hoped that from these busy stations Greek thought, as well as Greek goods, would radiate and conquer. But he had underrated the inertia and

resistance of the Oriental mind, and the mass and depth of Oriental culture. It was only a youthful fancy, after all, to suppose that so immature and unstable a civilization as that of Greece could be imposed upon a civilization immeasurably more widespread, and rooted in the most venerable traditions. The quantity of Asia proved too much for the quality of Greece. Alexander himself, in the hour of his triumph was conquered by the soul of the East; he married (among several ladies) the daughter of Darius; he adopted the Persian diadem and robe of state; he introduced into Europe the Oriental notion of the divine right of kings; and at last he astonished a skeptic Greece by announcing, in magnificent Eastern style, that he was a god. Greece laughed; and Alexander drank himself to death.

This subtle infusion of an Asiatic soul into the wearied body of the master Greek was followed rapidly by the pouring of Oriental cults and faiths into Greece along those very lines of communication which the young conqueror had opened up; the broken dykes let in the ocean of Eastern thought upon the lowlands of the still adolescent European mind. The mystic and superstitious faiths which had taken root among the poorer people of Hellas were reinforced and spread about; and the Oriental spirit of apathy and resignation found a ready soil in decadent and despondent Greece. The introduction of the Stoic philosophy into Athens by the Phoenician merchant Zeno (about 310 B. C.) was but one of a multitude of Oriental infiltrations. Both Stoicism and Epicureanism—the apathetic acceptance of defeat, and the effort to forget defeat in the arms of pleasure—were theories as to how one might yet be happy though subjugated or en-

slaved; precisely as the pessimistic Oriental stoicism of Schopenhauer and the despondent Epicureanism of Renan were in the nineteenth century the symbols of a shattered Revolution and a broken France.

Not that these natural antitheses of ethical theory were quite new to Greece. One finds them in the gloomy Heraclitus and the "laughing philosopher" Democritus; and one sees the pupils of Socrates dividing into Cynics and Cyrenaics under the lead of Antisthenes and Aristippus, and extolling, the one school apathy, the other happiness. Yet these were even then almost exotic modes of thought; imperial Athens did not take to them. But when Greece had seen Chaeronea in blood and Thebes in ashes, it listened to Diogenes; and when the glory had departed from Athens she was ripe for Zeno and Epicurus.¹

Zeno built his philosophy of apathy on a determinism which a later Stoic, Chrysippus, found it hard to distinguish from Oriental fatalism. When Zeno, who did not believe in slavery, was beating his slave for some offense, the slave pleaded, in mitigation, that by his master's philosophy he had been destined from all eternity to commit this fault; to which Zeno replied, with the calm of a sage, that on the same philosophy he, Zeno, had been destined to beat him for it. As Schopenhauer deemed it useless for the individual will to fight the universal will, so the Stoic argued that philosophic difference was the only reasonable attitude to a life in which the struggle for existence is so unfairly doomed to inevitable defeat. If victory is quite impossible it should

¹The table on page two indicates approximately the main lines of philosophical development in Europe and America.

be scorned. The secret of peace is not to make our achievements equal to our desires, but to lower our desires to the level of our achievements. "If what you have seems insufficient to you," said the Roman Stoic Seneca (d. 65 A. D.), "then, though you possess the world, you will yet be miserable."

Such a principle cried out to heaven for its opposite, and Epicurus, though himself as Stoic in life as Zeno, supplied it. Epicurus, says Fenelon,² "bought a fair garden, which he tilled himself. There it was he set up his school, and there he lived a gentle and agreeable life with his disciples, whom he taught as he walked and worked.... He was gentle and affable to all men.... he held there was nothing nobler than to apply oneself to philosophy." His starting point is a conviction that apathy is impossible, and that pleasure—though not necessarily sensual pleasure—is the only conceivable, and quite legitimate, end of life and action. "Nature leads every organism to prefer its own good to every other good";—even the Stoic finds a subtle pleasure in renunciation. "We must not avoid pleasures, but we must select them." Epicurus, then, is no epicurean; he exalts the joys of intellect rather than those of sense; he warns against pleasures that excite and disturb the soul which they should rather quiet and appease; he recognizes, with Socrates, that the happiness of the sensualist who passes feverishly and unsatisfied from one pleasure to another, is "the happiness of one who itches that he may scratch, and scratches that he may itch."³ In the end he proposes to seek not pleasure

²Quoted as motto on the title-page of Anatole France's *Garden of Epicurus*.

³Gorgias § 492.

in its usual sense, but *ataraxia*—tranquillity, equanimity, repose of mind; all of which trembles on the verge of “apathy.”

The Romans, coming to despoil Hellas in 146 B. C., found these rival schools dividing the philosophic field; and having neither leisure nor subtlety for speculation themselves, brought back these philosophies with their other spoils to Rome. Great organizers, as much as inevitable slaves, tend to stoic moods: it is difficult to be either master or servant if one is sensitive. So such philosophy as Rome had was mostly of Zeno's school, whether in Marcus Aurelius the emperor or in Epicurus the slave; and even Lucretius talked epicureanism stoically (like Heine's Englishman taking his pleasures sadly), and concluded his stern gospel of pleasure by committing suicide. His noble epic “On the Nature of Things,”⁴ follows Epicurus in damning pleasure with faint praise. Almost contemporary with Caesar and Pompey, he lived in the midst of turmoil and alarms; his nervous pen is forever inditing prayers to tranquillity and peace. One pictures him as a timid soul whose youth had been darkened with religious fears; for he never tires of telling his readers that there is no hell, except here, and that there are no gods except gentlemanly ones who live in a garden of Epicurus in the clouds, and never intrude in the affairs of men. To the rising cult of heaven and hell among the people of Rome he opposes a ruthless materialism. Soul and mind are evolved with the body, grow with its growth, ail with its ailments, and die with its death. Nothing exists but atoms,

⁴Professor Shotwell (*Introduction to the History of History*) calls it “the most marvelous performance in all antique literature.”

THE STORY OF

space, and law; and the law of laws is that of evolution and dissolution everywhere.

No single thing abides, but all things flow.

Fragment to fragment clings; the things thus grow

Until we know and name them. By degrees
They melt, and are no more the things we know.

Globed from the atoms falling slow or swift
I see the suns, I see the systems lift
Their forms; and even the systems and their
suns

Shall go back slowly to the eternal drift.

Thou too, O Earth—thine empires, lands and seas—
Least, with thy stars, of all the galaxies,

Globed from the drift like these, like these thou
too

Shalt go. Thou art going, hour by hour, like these.

Nothing abides. Thy seas in delicate haze
Go off; those mooned sands forsake their place;
And where they are shall other seas in turn
Mow with their scythes of whiteness other bays.⁵

To astronomical evolution and dissolution add
the origin and elimination of species

Many monsters too the earth of old tried to produce, things of strange face and limbs; . . . some without feet, some without hands, some without mouth, some without eyes. . . . Every other monster . . . of this kind the earth would produce, but in vain; for nature set a ban on their increase, they could not reach the coveted flower of age, nor find food, nor be united in marriage. . . . and many races of living things must then have died out and been unable to beget and continue their breed. For in the case of all things which you see breathing the breath of life, either craft or courage or speed has from the beginning of its existence protected and preserved each particular race. . . . Those to whom nature has granted none of these qualities would lie exposed as a prey

⁵Paraphrase by Mallock: *Lucretius on Life and Death*, pp. 15-16.

and booty to others until nature brought their kind to extinction.⁶

Nations, too, like individuals, slowly grow and surely die: "some nations wax, others wane, and in a brief space the races of living things are changed, and like runners hand over the lamp of life." In the face of warfare and inevitable death, there is no wisdom but in ataraxia,—"to look on all things with a mind at peace." Here, clearly, the old pagan joy of life is gone, and an almost exotic spirit touches a broken lyre. History, which is nothing if not humorous, was never so facetious as when she gave to this abstemious and epic pessimist the name of Epicurean.

And if this is the spirit of the follower of Epicurus, imagine the exhilarating optimism of explicit Stoics like Aurelius or Epictetus. Nothing in all literature is so depressing as the "Dissertations" of the slave, unless it be the "Meditations" of the emperor. "Seek not to have things happen as you choose them, but rather choose that they should happen as they do; and you shall live prosperously."⁷ No doubt one can in this manner dictate the future, and play royal highness to the universe. Story has it that Epictetus' master, who treated him with consistent cruelty, one day took to twisting Epictetus' leg to pass the time away. "If you go on," said Epictetus calmly, "you will break my leg." The master went on, and the leg was broken. "Did I not tell you," Epictetus observed mildly, "that you would break my leg?"⁸ Yet there is a certain mystic nobility in this philosophy, as in

⁶V., 830f. translation by Munro.

⁷*Encheiridion and Dissertations of Epictetus*; ed. Rolleston; p. 81.

⁸*Ibid.*, xxxvi.

the quiet courage of some Dostoevskian pacifist. "Never in any case say, I have lost such a thing; but, I have returned it. Is thy child dead?—it is returned. Is thy wife dead?—she is returned. Art thou deprived of thy estate?—is not this also returned?"⁹ In such passages we feel the proximity of Christianity and its dauntless martyrs; indeed were not the Christian ethic of self-denial, the Christian political ideal of an almost communistic brotherhood of man, and the Christian eschatology of the final conflagration of all the world, fragments of Stoic doctrine floating on the stream of thought? In Epictetus the Greco-Roman soul has lost its paganism, and is ready for a new faith. His book had the distinction of being adopted as a religious manual by the early Christian Church. From these "Dissertations" and Aurelius' "Meditations" there is but a step to "The Imitation of Christ."

Meanwhile the historical background was melting into newer scenes. There is a remarkable passage in Lucretius¹⁰ which describes the decay of agriculture in the Roman state, and attributes it to the exhaustion of the soil. Whatever the cause, the wealth of Rome passed into poverty, the organization into disintegration, the power and pride into decadence and apathy. Cities faded back into the undistinguished hinterland; the roads fell into disrepair and no longer hummed with trade; the small families of the educated Romans were outbred by the vigorous and untutored German stocks that crept, year after year, across the frontier; pagan culture yielded to Oriental cults; and

⁹*Encheiridion*, etc., 86.

¹⁰II, 1170. This oldest is also the latest theory of the decline of Rome; cf. Simkovich: *Toward the Understanding of Jesus*; New York, 1921.

almost imperceptibly the Empire passed into the Papacy.

The Church, supported in its earlier centuries by the emperors whose powers it gradually absorbed, grew rapidly in numbers, wealth, and range of influence. By the thirteenth century it owned one-third of the soil of Europe,¹¹ and its coffers bulged with donations of rich and poor. For a thousand years it united, with the magic of an unvarying creed, most of the peoples of a continent; never before or since was organization so widespread or so pacific. But this unity demanded, as the Church thought, a common faith exalted by supernatural sanctions beyond the changes and corosions of time; therefore dogma, definite and defined, was cast like a shell over the adolescent mind of medieval Europe. It was within this shell that Scholastic philosophy moved narrowly from faith to reason and back again, in a baffling circuit of uncriticized assumptions and pre-ordained conclusions. In the thirteenth century all Christendom was startled and stimulated by Arabic and Jewish translations of Aristotle; but the power of the Church was still adequate to secure, through Thomas Aquinas and others, the transmogrification of Aristotle into a medieval theologian. The result was subtlety, but not wisdom. "The wit and mind of man," as Bacon put it, "if it work upon the matter worketh according to the stuff, and is limited thereby; but if it work upon itself, as the spider worketh his web, then it is endless, and bringeth forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit." Sooner or later the intellect of Europe would burst out of this shell.

After a thousand years of tillage, the soil

¹¹Robinson and Beard: *Outlines of European History*. Boston, 1914, i, 443.

bloomed again; goods were multiplied into a surplus that compelled trade; and trade at its cross-roads built again great cities wherein men might co-operate to nourish culture and rebuild civilization.¹² The Crusades opened the routes to the East, and let in a stream of luxuries and heresies that doomed asceticism and dogma. Paper now came cheaply from Egypt, replacing the costly parchment that had made learning the monopoly of priests; printing, which had long awaited an inexpensive medium, broke out like a liberated explosive, and spread its destructive and clarifying influence everywhere. Brave mariners, armed now with compasses, ventured out into the wilderness of the sea, and conquered man's ignorance of the earth; patient observers, armed with telescopes, ventured out beyond the confines of dogma, and conquered man's ignorance of the sky. Here and there, in universities and monasteries and hidden retreats, men ceased to dispute and began to search; deviously, out of the effort to change baser metal into gold, alchemy was transmuted into chemistry; out of astrology men groped their way with timid boldness to astronomy; and out of the fables of speaking animals came the science of zoology. The awakening began with Roger Bacon (d. 1294); it grew with the limitless Leonardo (1452-1519); it reached its fulness in the astronomy of Copernicus (1473-1543) and Galileo (1564-1642), in the researches of Gilbert (1544-1603) in magnetism and electricity, of Vesalius (1514-1564) in anatomy, and of Harvey (1578-1657) on the circulation of the blood. As

¹²The reader probably knows that *city*, *civility*, *culture*, and *civilization* have all one identical Latin root; just as one Greek root gives us *polity*, *politeness*, and *polish* (but alas, also *policemen* and *politics*).

knowledge grew, fear decreased; men thought less of worshiping the unknown, and more of overcoming it. Every vital spirit was lifted up with a new confidence; barriers were broken down; there was no bound now to what man might do. "But that little vessels, like the celestial bodies, should sail round the whole globe, is the happiness of our age. These times may justly use *plus ultra*"—more beyond—"where the ancients used *non plus ultra*."¹³ It was an age of achievement, hope and vigor; of new beginnings and enterprises in every field. It was an age that waited for a voice, some synthetic soul to sum up its spirit and resolve. It was Francis Bacon, "the most powerful mind of modern times,"¹⁴ who "rang the bell that called the wits together," and announced that Europe had come of age.

II. THE POLITICAL CAREER OF FRANCIS BACON

Bacon was born on January 22, 1561, at York House, London, the residence of his father, Sir Nicholas Bacon, who for the first twenty years of Elizabeth's reign had been Keeper of the Great Seal. "The fame of the father," says Macaulay, "has been thrown into the shade by that of the son. But Sir Nicholas was no ordinary man."¹⁵ It is as one might have suspected; for genius is an apex, to which a family builds itself through talent, and through talent in the genius's offspring subsides again

¹³Bacon: *The Advancement of Learning*; bk. ii, ch. 10. A medieval motto showed a ship turning back at Gibraltar into the Mediterranean, with the inscription, *Non plus ultra*—go no farther.

¹⁴E. J. Payne in *The Cambridge Modern History*, I, 65.

¹⁵*Essays*; New York, 1860; iii, 342.

towards the mediocrity of man. Bacon's mother was Lady Anne Cooke, sister-in-law of Sir William Cecil, Lord Burghley, who was Elizabeth's Lord Treasurer, and one of the most powerful men in England. Her father had been chief tutor of King Edward VI; she herself was a linguist, and a theologian, and thought nothing of corresponding in Greek with bishops. She made herself instructress of her son, and spared no pains in his education.

But the real nurse of Bacon's greatness was Elizabethan England, the greatest age of the most powerful of modern nations. The discovery of America had diverted trade from the Mediterranean to the Atlantic, and had raised the Atlantic nations—Spain and France and Holland and England—to that commercial and financial supremacy which had been Italy's when half of Europe had made her its port of entry and exit in the Eastern trade; and with this change the Renaissance had passed from Florence and Rome and Milan and Venice to Madrid and Paris and Amsterdam and London. After the destruction of the Spanish naval power in 1588, the commerce of England spread over every sea, her towns thrrove with domestic industry, her captains navigated the globe and won America. Her literature blossomed into Spenser's poetry and Sidney's prose; her stage throbbed with the dramas of Shakespeare and Marlowe and Ben Jonson and a hundred vigorous pens. No man could fail to flourish in such a time and country, if there was seed in him at all.

In his twelfth year Bacon was sent to Trinity College, Cambridge. He stayed there three years, and left it with a strong dislike of its texts and methods, a confirmed hostility to the cult of Aristotle, and a resolve to set philosophy into a more fertile path, to turn it

from scholastic disputation to the illumination and increase of human good. Though still a lad of sixteen, he was offered an appointment to the staff of the English ambassador in France; and after careful casting up of pros and cons, he accepted. In the Proem to *The Interpretation of Nature*, he discusses this fateful decision that turned him from philosophy to politics. It is an indispensable passage:

Whereas, I believed myself born for the service of mankind, and reckoned the care of the common weal to be among those duties that are of public right, open to all alike, even as the waters and the air, I therefore asked myself what could most advantage mankind, and for the performance of what tasks I seemed to be shaped by nature. But when I searched, I found no work so meritorious as the discovery and development of the arts and inventions that tend to civilize the life of man.... Above all, if any man could succeed—not merely in bringing to light some one particular invention, however useful—but in kindling in nature a luminary which would, at its first rising, shed some light on the present limits and borders of human discoveries, and which afterwards, as it rose still higher, would reveal and bring into clear view every nook and cranny of darkness, it seemed to me that such a discoverer would deserve to be called the true Extender of the Kingdom of Man over the universe, the Champion of human liberty, and the Exterminator of the necessities that now keep men in bondage. Moreover, I found in my own nature a special adaptation for the contemplation of truth. For I had a mind at once versatile enough for that most important object—I mean the recognition of similitudes—and at the same time sufficiently steady and concentrated for the observation of subtle shades of difference. I possessed a passion for research, a power of suspending judgment with patience, of meditating with pleasure, of assenting with caution, of correcting false impressions with readiness, and of arranging my thoughts with scrupulous pains. I had no hankering after novelty, no blind admiration for

antiquity. Imposture in every shape I utterly detested. For all these reasons I considered that my nature and disposition had, as it were, a kind of kinship and connection with truth.

But my birth, my rearing and education, had all pointed, not toward philosophy, but toward politics: I had been, as it were, imbued in politics from childhood. And as is not unfrequently the case with young men, I was sometimes shaken in my mind by opinions. I also thought that my duty towards my country had special claims upon me, such as could not be urged by other duties of life. Lastly, I conceived the hope that, if I held some honorable office in the state, I might have secured helps and supports to aid my labors, with a view to the accomplishment of my destined task. With these motives I applied myself to politics.¹⁶

Sir Nicholas Bacon died suddenly in 1579. He had intended to provide Francis with an estate; but death overreached his plans, and the young diplomat, called hurriedly to London, found himself, at the age of eighteen, fatherless and almost penniless. He had become accustomed to most of the luxuries of the age, and he found it hard to reconcile himself now to a hard simplicity of life. He took up the practice of law (1582), while he importuned his influential relatives to advance him to some political office which would liberate him from economic worry. His almost begging letters had small result, considering the grace and vigor of their style, and the proved ability of their author. Perhaps it was because Bacon did not underrate this ability, and looked upon position as his due, that Burghley failed to make the desired response; and perhaps, also these letters protested too much the past, present and future loyalty of the writer to the honorable Lord: in politics,

¹⁶Translation by Abbott: *Francis Bacon*; London, 1885; p. 37.

as in love and war, it does not do to give oneself wholly; one should at all times give, but at no time all. Gratitude must be nourished with expectation.

Eventually, Bacon climbed without being lifted from above; but every step cost him many years. In 1583 he was elected to Parliament for Taunton; and his constituents liked him so well that they returned him to his seat in election after election. He had a terse and vivid eloquence in debate, and was an orator without oratory. "No man," said Ben Jonson, "evr spoke more neatly, more [com]pressedly, more weightily, or suffered less emptiness, less idleness in what he uttered. No member of his speech but consisted of its own graces. His hearers could not cough or look aside from him without loss. He commended where he spoke....No man had their affections more in his power. The fear of every man that heard him was lest that he should make an end."¹⁷

One powerful friend was generous to him—that handsome Earl of Essex whom Elizabeth loved unsuccessfully, and so learned to hate. In 1905 Essex, to atone for his failure in securing a political post for Bacon, presented him with a pretty estate at Twickenham. It was a magnificent gift, which one might presume would bind Bacon to Essex for life; but it did not. A few years later Essex organized a conspiracy to imprison Elizabeth and select her successor to the throne. Bacon wrote letter after letter to his benefactor, protesting against this treason; and when Essex persisted, Bacon warned him that he would put loyalty to his Queen above even gratitude to his

¹⁷Nichol: *Francis Bacon*; Edinburgh, 1907; i, 37.

friend. Essex made his effort, failed, and was arrested. Bacon pled with the Queen in his behalf so incessantly that at last she bade him "speak of any other subject." When Essex, temporarily freed, gathered armed forces about him, marched into London, and tried to rouse its populace to revolution, Bacon turned angrily against him. Meanwhile Bacon had been given a place in the prosecuting office of the realm; and when Essex, again arrested, was tried for treason, Bacon took active part in the prosecution of the man who had been his unstinting friend.¹⁸

Essex was found guilty, and was put to death. Bacon's part in the trial made him for a while unpopular; and from this time on he lived in the midst of enemies watching for a chance to destroy him. His insatiable ambition left him no rest; he was ever discontented, and always a year or so ahead of his income. He was lavish in his expenditures; display was to him a part of policy. When, at the age of forty-five, he married, the pompous and costly ceremony made a great gap in the dowry which had constituted one of the lad's attractions. In 1598 he was arrested for debt. Nevertheless, he continued to advance. His varied

¹⁸Hundreds of volumes have been written on this aspect of Bacon's career. The case against Bacon, as "the wisest and meanest of mankind" (as Pope called him), will be found in Macaulay's essay, and more circumstantially in Abbott's *Francis Bacon*: these would apply to him his own words: "Wisdom for a man's self is the wisdom of rats, that will be sure to leave a house somewhat before it falls" (Essay "Of Wisdom for a Man's Self"). The case for Bacon is given in Spedding's *Life and Times of Francis Bacon*, and in his *Evenings with a Reviewer* (a detailed reply to Macaulay). *In medio veritas.*

ability and almost endless knowledge made him a valuable member of every important committee; gradually higher offices were opened to him: in 1606 he was made Solicitor-General; in 1613 he became Attorney-General; in 1618, at the age of fifty-seven, he was at last Lord Chancellor.

III. THE ESSAYS¹⁹

His elevation seemed to realize Plato's dreams of a philosopher-king. For, step by step with his climb to political power, Bacon had been mounting the summits of philosophy. It is almost incredible that the vast learning and literary achievements of this man were but the incidents and diversions of a turbulent political career. It was his motto that one lived best by the widest life—*bene vixit qui bene latuit*. He could not quite make up his mind whether he liked more the contemplative or the active life. His hope was to be philosopher and statesman, too, like Seneca; though he suspected that this double direction of his life would shorten his reach and lessen his attainment. "It is hard to say," he writes,²⁰ "whether mixture of contemplations with an active life, or retiring wholly to contemplations, do disable or hinder the mind more." He felt that studies could not be either end or wisdom in themselves, and that knowledge unapplied in action was a pale academic vanity. "To spend too much time in studies is sloth;

¹⁹The author has thought it better, throughout this essay, to make no attempt to concentrate further the already compact thought of Bacon, and to put the philosopher's wisdom in his own incomparable English rather than to take probably greater space to say the same things with less clarity, beauty, and force.

²⁰Valerius Terminus, *ad fin.*

to use them too much for ornament is affectation; to make judgment wholly by their rules is the humor of a scholar.... Crafty men condemn studies, simple men admire them, and wise men use them; for they teach not their own use; but that is a wisdom without them, and above them, won by observation."²¹ Here is a new note, which marks the end of scholasticism—the divorce of knowledge from use and observation—and places that emphasis on experience and results which distinguishes English philosophy, and culminates in pragmatism. Not that Bacon for a moment ceased to love books and meditation; in words reminiscent of Socrates he writes, "without philosophy I care not to live";²² and he describes himself as after all "a man naturally fitted rather for literature than for anything else, and borne by some destiny, against the inclination of his genius" (i. e., character) "into active life."²³ Almost his first publication was called "The Praise of Knowledge" (1592); its enthusiasm for philosophy compels quotation:

My praise shall be dedicate to the mind itself. The mind is the man, and knowledge mind; a man is but what he knoweth. . . . Are not the pleasures of the senses, and are not the pleasures of the intellect greater than the pleasures of the affections? Is not that only a true and natural pleasure whereof there is no satiety? Is not that knowledge alone that doth clear the mind of all perturbations? How many things be there which we imagine are not? How many things do we esteem and value more than they are? These vain imaginations, these ill-proportioned estimations, these be the clouds of error that turn into the storms of perturbations. Is there then any such happiness as for a man's mind to be raised above the confusion of things, where he may have a respect of

²¹"Of Studies."

²²Dedication of *Wisdom of the Ancients*.

²³*De Augmentis*, viii, 8.

the order of nature and the error of men? Is there but a view only of delight and not of discovery? Of contentment and not of benefit? Shall we not discern as well the riches of nature's warehouse as the beauty of her shop? Is truth barren? Shall we not thereby be able to produce worthy effects, and to endow the life of man with infinite commodities?

His finest literary product, the *Essays* (1597-1623), show him still torn between these two loves, for politics and for philosophy. In the "Essay of Honor and Reputation" he gives all the degrees of honor to political and military achievements, none to the literary or the philosophical. But in the essay "Of Truth" he writes: "The inquiry of truth, which is the love-making or wooing of it; the knowledge of truth, which is the praise of it; and the belief of truth, which is the enjoying of it, is the sovereign good of human natures." In books "we converse with the wise, as in action with fools." That is, if we know how to select our books. "Some books are to be tasted," reads a famous passage, "others to be swallowed, and some few to be chewed and digested"; all these groups forming, no doubt, an infinitesimal portion of the oceans and cataracts of ink in which the world is daily bathed and poisoned and drowned.

Surely the *Essays* must be numbered among the few books that deserve to be chewed and digested. Rarely shall you find so much meat in so small a dish, or so admirably dressed and flavored. Bacon abhors padding, and despairs to waste a word; he offers us infinite riches in a little phrase; each of these essays gives in a page or two the distilled subtlety of a master mind on a major issue of life. It is difficult to say whether the matter or the manner more excels; for here is language as supreme in prose as Shakespeare's is in verse.

It is a style like sturdy Tacitus, compact yet polished; and indeed some of its conciseness is due to the skillful adaptation of Latin idiom and phrase. But its wealth of metaphor is characteristically Elizabethan, and reflects the exuberance of the Renaissance; no man in English literature is so fertile in pregnant and pithy comparisons. Their lavish array is the one defect of Bacon's style: the endless metaphors and allegories and allusions fall like whips upon our nerves and tire us out at last. The *Essays* are like rich and heavy food, which cannot be digested in large quantities at once; but taken four or five at a time they are the finest intellectual nourishment in English.²⁴

What shall we extract from this extracted wisdom? Perhaps the best starting point, and the most arresting deviation from the fashions of mediæval philosophy, is Bacon's frank acceptance of the Epicurean ethic. "That philosophical progression, 'Use not that you may not wish, wish not that you may not fear,' seems an indication of a weak, diffident and timorous mind. And indeed most doctrines of the philosophers appear to be too distrustful, and to take more care of mankind than the nature of the thing requires. Thus they increase the fears of death by the remedies they bring against it; for whilst they make the life of man little more than a preparation and discipline for death, it is impossible but the enemy must appear terrible when there is no end of the defense to be made against him."²⁵ Nothing could be so injurious to health as the Stoic repression of desire; what is the use of

²⁴The author's preference is for Essays 2, 7, 8, 11, 12, 16, 18, 20, 27, 29, 38, 39, 42, 46, 48, 50, 52, 54.

²⁵Adv. of L., vii, 2. Certain passages from this book are brought in here, to avoid a retracing of the line of exposition under each work.

prolonging a life which apathy has turned into premature death? And besides, it is an impossible philosophy; for instinct will out. "Nature is often hidden; sometimes overcome; seldom extinguished. Force maketh nature more violent in the return; doctrine and discourse maketh nature less importune; but custom only doth alter or subdue nature. . . . But let not a man trust his victory over his nature too far; for nature will lie buried a great time, and yet revive upon the occasion or temptation. Like as it was with Aesop's damsel, turned from a cat to a woman, who sat very demurely at the board's end, till a mouse ran before her. Therefore let a man either avoid the occasion altogether, or put himself often to it, that he may be little moved with it."²⁶ Indeed Bacon thinks the body should be inured to excesses as well as to restraint; else even a moment of unrestraint may ruin it. (So one accustomed to the purest and most digestible foods is easily upset when forgetfulness or necessity diverts him from perfection.) Yet "variety of delights rather than surfeit of them"; for "strength of nature in youth passeth over many excesses which are owing a man till his age";²⁷ a man's maturity pays the price of his youth. One royal road to health is a garden; Bacon agrees with the author of *Genesis* that "God Almighty first planted a garden"; and with Voltaire that "one must cultivate one's garden."

The moral philosophy of the *Essays* smacks rather of Machiavelli than of the Christianity to which Bacon made so many astute obeisances. "We are beholden to Machiavel, and writers of that kind, who openly and unmasked declare what men do in fact, and not what they ought to do; for it is impossible to join the

²⁶"Of Nature in Men."

²⁷"Of Regiment of Health."

wisdom of the serpent and the innocence of the dove, without a previous knowledge of the nature of evil; as, without this, virtue lies exposed and ungarded."²⁸ The Italians have an ungracious proverb, *Tanto buon che val niente*,"—so good that he is good for nothing.²⁹ Bacon accords his preaching with his practice, and advises a judicious mixture of dissimulation with honesty, like an alloy that will make the purer but softer metal capable of longer life. He wants a full and varied career, giving acquaintance with everything that can broaden, deepen, strengthen or sharpen the mind. He does not admire the merely contemplative life; like Goethe he scorns knowledge that does not lead to action: "men ought to know that in the theater of human life it is only for Gods and angels to be spectators."³⁰

His religion is patriotically like the King's. Though he was more than once accused of atheism, and the whole trend of his philosophy is secular and rationalistic, he makes an eloquent, and apparently sincere disclaimer of unbelief. "I had rather believe all the fables in the Legend, and the Talmud, and the Alcoran, than that this universal frame is without a mind....A little philosophy inclineth a man's mind to atheism; but depth in philosophy bringeth men's minds about to religion. For while the mind of man looketh upon second causes scattered, it may sometimes rest in them and go no further; but when it beholdeth the chain of them, confederate and linked together, it must needs fly to Providence and Deity."³¹ Religious (like political) indifference is due to a multiplicity of factions.

²⁸Adv. of I., xii, 2.

²⁹"Of Goodness."

³⁰Adv. of L., vii, 1.

³¹"Of Atheism."

"The causes of atheism are, divisions in religion, if they be many; for any one division added zeal to both sides; but many divisions introduce atheism....And lastly, learned times, especially with peace and prosperity; for troubles and adversities do more bow men's minds to religion."³²

But Bacon's value lies less in theology and ethics than in psychology. He is an undeviable analyst of human nature, and sends his shaft into every heart. On the oldest subject in the world he is refreshingly original. "A married man is seven years older in his thoughts the first day."³³ "It is often seen that bad husbands have good wives." (Bacon was an exception.) "A single life doth well with churchmen, for charity will hardly water the ground where it must first fill a pool....He that hath wife and children hath given hostages to fortune; for they are impediments to great enterprises, either of virtue or mischief."³⁴ Bacon seems to have worked too hard to have had time for love, and perhaps he never quite felt it to its depth. "It is a strange thing to note the excess of this passion....There was never proud man thought so absurdly well of himself as the lover doth of the person beloved....You may observe that amongst all the great and worthy persons (whereof the memory remaineth either ancient or recent), there is not one that hath been transported to the mad degree of love; which shows that great spirits and great business do keep out this weak passion."³⁵

³²"Of Atheism."

³³Letter to Lord Burghley, 1606.

³⁴"Of Marriage and Single Life." Contrast the more pleasing phrase of Shakespeare, that "Love gives to every power a double power."

³⁵"Of Love."

He values friendship more than love, though of friendship too he can be skeptical. "There is little friendship in the world, and least of all between equals, which was wont to be magnified. That that is is between superior and inferior, whose fortunes may comprehend the one the other....A principal fruit of friendship is the ease and discharge of the fullness and swellings of the heart, which passions of all kinds do cause and induce." A friend is an ear. "Those that want friends to open themselves unto are cannibals of their own hearts....Whoever hath his mind fraught with many thoughts, his wits and understanding do clarify and break up in the communicating and discoursing with another; he tosseth his thoughts more easily; he marshaleth them more orderly; he seeth how they look when they are turned into words; finally; he waxeth wiser than himself; and that more by one hour's discourse than by a day's meditation."³⁶

In the essay "Of Youth and Age" he puts a book into a paragraph. "Young men are fitter to invent than to judge, fitter for execution than for counsel, and fitter for new projects than for settled business; for the experience of age in things that fall within the compass of it, directeth them; but in new things abuseth them....Young men, in the conduct and management of actions, embrace more than they can hold, stir more than they can quiet; fly to the end without consideration of the means and degrees; pursue absurdly some few principles which they have chanced upon; care not to" (i. e., how they) "innovate, which draws unknown inconveniences....Men of age object too much, consult too long, adventure too little, repent too soon, and seldom drive business

home to the full period, but content themselves with a mediocrity of success. Certainly it is good to compel employments of both.... because the virtues of either may correct the defects of both." He thinks, nevertheless, that youth and childhood may get too great liberty, and so grow disordered and lax. "Let parents choose betimes the vocations and courses they mean their children should take, for then they are most flexible; and let them not too much apply themselves to the disposition of their children, as thinking they will take best to that which they have most mind to. It is true that, if the affections or aptness of the children be extraordinary, then it is good not to cross it; but generally the precept" of the Pythagoreans "is good, *Optimum lege, suave et facile illud faciet consuetudo*,"—choose the best; custom will make it pleasant and easy.³⁷ For "custom is the principal magistrate of man's life."³⁸

The politics of the Essays preach a conservatism natural in one who aspired to rule. Bacon wants a strong central power. Monarchy is the best form of government; and usually the efficiency of a state varies with the concentration of power. "There be three points of business" in government: "the preparation; the debate or examination; and the perfection" (or execution). "Whereof, if you look for dispatch, let the middle only be the work of many, and the last the work of a few."³⁹ He is an outspoken militarist; he deplores the growth of industry as unfitting men for war, and bewails long peace as lulling the warrior in man. (He did not see that some day factories, and not armies, would win wars.) Nevertheless, he recognizes

³⁷"Of Parents and Children."

³⁸"Of Custom."

³⁹"Of Dispatch."

the importance of raw materials: "Solon said well to Croesus [when in ostentation Croesus showed him his gold], 'Sir, if any other come that hath better iron than you, he will be master of all this gold.'"⁴⁰ Like Aristotle, he has some advice on avoiding revolutions. "The surest way to prevent seditions . . . is to take away the matter of them; for if there be fuel prepared, it is hard to tell whence the spark shall come that shall set it on fire. . . . Neither doth it follow that the suppressing of flames" (i. e., discussion) "with too much severity should be a remedy of troubles; for the despising of them many times checks them best, and the going about to stop them but makes a wonder longlived. . . . The matter of sedition is of two kinds: much poverty and much discontentment. . . . The causes and motives of seditions are, innovation in religion; taxes; alteration of laws and customs; breaking of privileges; general oppression; advancement of unworthy persons, strangers; dearths; disbanded soldiers, factions grown desperate; and whatsoever in offending a people joineth them in a common cause." The cue of every leader, of course, is to divide his enemies and to unite his friends. "Generally, the dividing and breaking of all factions . . . that are adverse to the state, and setting them at a distance, or at least distrust, among themselves, is not one of the worst remedies; for it is a desperate case, if those that hold with the proceeding of the state be full of discord and faction, and those that are against it be entire and united."⁴¹ A better recipe for the avoidance of revolutions is an equitable distribution of wealth: "Money is like muck, not good unless it be spread."⁴² But this

⁴⁰"Of the True Greatness of Kingdoms."

⁴¹"Of Seditions and Troubles."

⁴²*Ibid.*

does not mean socialism, or even democracy; Bacon distrusts the people, who were in his day quite without access to education; "the lowest of all flatteries is the flattery of the common people";⁴³ and "Phocion took it right, who, being applauded by the multitude, asked, What had he done amiss?"⁴⁴ What Bacon wants is first a yeomanry of owning farmers; then an aristocracy for administration; and above all a philosopher king. "It is almost without instance that any government was unprosperous under learned governors."⁴⁵ He mentions Seneca, Antoninus, Pius and Aurelius; it was his hope that posterity would add his name to theirs.

IV. THE GREAT RECONSTRUCTION

Unconsciously, in the midst of his triumphs, his heart was with philosophy. It had been his nurse in youth, it was his companion in office, it was to be his consolation in prison and disgrace. He lamented the ill-repute into which, he thought, philosophy had fallen, and blamed an arid scholasticism. "People are very apt to contemn truth, on account of the controversies raised about it, and to think those all in a wrong way who never meet."⁴⁶ "The sciences....stand almost at a stay, without receiving any augmentations worthy of the human race;and all the tradition and succession of schools is still a succession of masters and scholars, not of inventors....In what is now done in the matter of science there is only a whirling about, and perpetual agitation, ending where it began."⁴⁷ All

⁴³In Nichol, ii, 149.

⁴⁴Adv. of L., vi, 3.

⁴⁵Adv. of L., i.

⁴⁶Ibid.

⁴⁷Preface to *Magna Instauratio*.

through the years of his rise and exaltation he brooded over the restoration or reconstruction of philosophy; "*Meditor Instaurationem philosophiae.*"⁴⁸

He planned to center all his studies around this task. First of all, he tells us in his "Plan of the Work," he would write some *Introductory Treatises*, attributing the stagnation of philosophy to the posthumous persistence of old methods, and outlining his proposals for a new beginning. Secondly, he would attempt a new *Classification of the Sciences*, allocating their material to them, and listing the unsolved problems in each field. Thirdly, he would describe his new method for the *Interpretation of Nature*. Fourthly, he would try his busy hand at actual natural science, and investigate the *Phenomena of Nature*. Fifthly, he would show the *Ladder of the Intellect*, by which the writers of the past had mounted towards the truths that were now taking form out of the background of medieval verbiage. Sixthly, he would attempt certain *Anticipations* of the scientific results which he was confident would come from the use of his method. And lastly, as *Second (or Applied) Philosophy*, he would picture the utopia which would flower out of all this budding science of which he hoped to be the prophet. The whole would constitute the *Magna Instauratio*, the Great Reconstruction of Philosophy.⁴⁹

⁴⁸ *Redargutio Philosophiarum*.

⁴⁹ Bacon's actual works under the foregoing heads are chiefly these:

- I. *De Interpretatione Naturae Proemium* (Introduction to the Interpretation of Nature, 1603); *Redargutio Philosophiarum* (A Criticism of Philosophies, 1609).
- II. The *Advancement of Learning* (1603-5; translated as *De Augmentis Scientiarum*, 1622).

It was a magnificent enterprise, and—except for Aristotle—without precedent in the history of thought. It would differ from every other philosophy in aiming at practice rather than at theory, at specific concrete goods rather than at speculative symmetry. Knowledge is power, not mere argument or ornament; "it is not an opinion to be held...but a work to be done; and I...am laboring to lay the foundation not of any sect or doctrine, but of utility and power."⁵⁰ Here, for the first time, is the voice and tone of modern science.

1. THE ADVANCEMENT OF LEARNING

To produce works, one must have knowledge. "Nature cannot be commanded except by being obeyed."⁵¹ Let us learn the laws of nature, and we shall be her masters, as we are now, in ignorance, her thralls; science is the road to utopia. But in what condition this road is—tortuous, unlit, turning back upon itself, losing itself in useless by-paths, and leading not to light but to chaos. Let us then begin by making a survey of

- III. *Cogitata et Visa* (Things Thought and Seen, 1607); *Filum Labyrintri* (Thread of the Labyrinth, 1606); *Novum Organum* (The New Organon, 1608-20).
- IV. *Historia Naturalis* (Natural History, 1622); *Descriptio Globi Intellectualis* (Description of the Intellectual Globe, 1612).
- V. *Sylva Sylvarum* (Forest of Forests, 1624).
- VI. *De Principiis* (On Origins, 1621).
- VII. The New Atlantis (1624).

Note.—All of the above but *The New Atlantis* and *The Advancement of Learning* were written in Latin; and the latter was translated into Latin by Bacon and his aides, to win for it a European audience. Since historians and critics always use the Latin titles in their references, these are here given for the convenience of the student.

⁵⁰Preface to *Magna Instauratio*.

⁵¹Plan of the Work.

the state of the sciences, and marking out for them their proper and distinctive fields; let us "seat the sciences each in its proper place";⁵² examine their defects, their needs, and their possibilities; indicate the new problems that await their light; and in general "open and stir the earth a little about the roots" of them.⁵³

This is the task which Bacon set himself in *The Advancement of Learning*. "It is my intention," he writes, like a king entering his realm, "to make the circuit of knowledge, noticing what parts lie waste and uncultivated, and abandoned by the industry of man; with a view to engage, by a faithful mapping out of the deserted tracts, the energies of public and private persons in their improvement."⁵⁴ He would be the royal surveyor of the weed-grown fields, making straight the road, and dividing the lots among the laborers. It was a plan audacious to the edge of immodesty; but Bacon was still young enough (forty-two is young in a philosopher) to plan great voyages. "I have taken all knowledge to be my province," he had written to Burghley in 1592; not meaning that he would make himself a premature edition of the *Encyclopaedia Britannica*, but implying merely that his work would bring him into every field, as the critic and co-ordinator of every science in the task of social reconstruction. The very magnitude of his purpose gives a stately magnificence to his style, and brings him at times to the height of English prose.

So he ranges over the vast battleground in which human research struggles with natural hindrance and human ignorance; and in every field he sheds illumination. He attaches great importance to physiology and medicine; he

⁵²Adv. of L., viii.

⁵³Ibid., vi, 3.

⁵⁴Ibid., ii, 1.

exalts the latter as regulating "a musical instrument of much and exquisite workmanship easily put out of tune."⁵⁵ But he objects to the lax empiricism of contemporary doctors, and their facile tendency to treat all ailments with the same prescription—usually physic. "Our physicians are like bishops, that have the keys of binding and loosing, but no more."⁵⁶ They rely too much on mere haphazard, unco-ordinated individual experience; let them experiment more widely, let them illuminate human with comparative anatomy, let them dissect and if necessary vivisect; and above all, let them construct an easily accessible and intelligible record of experiments and results. Bacon believes that the medical profession should be permitted to ease and quicken death (euthanasia) where the end would be otherwise only delayed for a few days and at the cost of great pain; but he urges the physicians to give more study to the art of prolonging life. "This is a new part" of medicine, "and deficient, though the most noble of all; for if it may be supplied, medicine will not then be wholly versed in sordid cures, nor physicians be honored only for necessity, but as dispensers of the greatest earthly happiness that could well be conferred on mortals."⁵⁷ One can hear some sour Schopenhauerian protesting, at this point, against the assumption that longer life would be a boon, and urging, on the contrary, that the speed with which some physicians put an *end* to our illnesses is a consummation devoutly to be praised. But Bacon, worried and married and harassed though he was, never doubted that life was a very fine thing after all.

In psychology he is almost a "behaviorist":

⁵⁵ *De Aug.* iv. .

⁵⁶ *Adv. of L.*, iv, 2.

⁵⁷ *Ibid.*

he demands a strict study of cause and effect in human action, and wishes to eliminate the word *chance* from the vocabulary of science. "Chance is the name of a thing that does not exist."⁵⁸ And "what chance is in the universe, so will is in man."⁵⁹ Here is a world of meaning, and a challenge of war, all in a little line: the Scholastic doctrine of free will is pushed aside as beneath discussion; and the universal assumption of a "will" distinct from the "intellect" is discarded. These are leads which Bacon does not follow up;⁶⁰ it is not the only case in which he puts a book into a phrase and then passes blithely on.

Again, in a few words, Bacon invents a new science—social psychology. "Philosophers should diligently inquire into the powers and energy of custom, exercise, habit, education, example, imitation, emulation, company, friendship, praise, reproof, exhortation, reputation, laws, books, studies, etc.; for these are the things that reign in men's morals by these agents the mind is formed and subdued."⁶¹ So closely has this outline been followed by the new science that it reads almost like a table of contents for the works of Tarde, Le Bon, Ross, Wallas, and Durkheim.

Nothing is beneath science, nor above it. Sorceries, dreams, predictions, telepathic communications, "psychical phenomena" in general must be subjected to scientific examination; "for it is not known in what cases, and how far, effects attributed to superstition participate of natural causes."⁶² Despite his strong naturalistic

⁵⁸ *Novum Organum*, i, 60.

⁵⁹ *De Interpretatione Naturae*, in Nichol, ii, 118.

⁶⁰ They are developed in Spinoza's *Ethics*, Appendix to Book I.

⁶¹ *Adv. of L.*, vii, 3.

⁶² *De Aug.*, ix, in Nichol, ii, 129.

bent he feels the fascination of these problems; nothing human is alien to him. Who knows what unsuspected truth, what new science, indeed, may grow out of these investigations, as chemistry budded out from alchemy? "Alchemy may be compared to the man who told his sons he had left them gold buried somewhere in his vineyard; where they, by digging, found no gold, but by turning up the mould about the roots of the vines, procured a plentiful vintage. So the search and endeavors to make gold have brought many useful inventions and instructive experiments to light."⁶³

Still another science grows to form in Book VIII: the science of success in life. Not yet having fallen from power, Bacon offers some preliminary hints on how to rise in the world. The first requisite is knowledge: of ourselves and of others. *Gnothe seauton* is but half; know thyself is valuable chiefly as a means of knowing others. We must diligently

inform ourselves of the particular persons we have to deal with—their tempers, desires, views, customs, habies; the assistances, helps and assurances whereon they principally rely, and when they received their power, their defects and weaknesses, whereat they chiefly lie open and are accessible; their friends, factions, patrons, dependents, enemies, envious, rivals; their times and manners of access . . .

But the surest key for unlocking the minds of others turns upon searching and shifting either their tempers and natures, or their ends and designs; and the more weak and simple are best judged by their temper, but the more prudent and close by their designs. . . . But the shortest way to this whole inquiry rests upon three particulars: viz.—1. In procuring numerous friendships. . . . 2. In observing a prudent mean and moderation between freedom of discourse and silence. . . .

⁶³Adv. of L., I.

But above all, nothing conduces more to the well-representing a man's self, and securing his own right, than not to disarm oneself by too much sweetness and good-nature, which exposes a man to injuries and reproaches; but rather . . . at times to dart out some sparks of a free and generous mind, that have no less of the sting than the honey.⁶⁴

Friends are to Bacon chiefly means to power; he shares with Machiavelli a point of view which one is at first inclined to attribute to the Renaissance, till one thinks of the fine and uncalculating friendships of Michelangelo and Cavalieri, Montaigne and La Boetie, Sir Philip Sidney and Hubert Languet.⁶⁵ Perhaps this very practical assessment of friendship helps to explain Bacon's fall from power, as similar views help to explain Napoleon's; for a man's friends will seldom practice a higher philosophy in their relations with him than that which he professes in his treatment of them. Bacon goes on to quote Bias, one of the Seven Wise Men of ancient Greece: "Love your friend as if he were to become your enemy, and your enemy as if he were to become your friend."⁶⁶ Do not betray even to your friend too much of your real purposes and thoughts; in conversation, ask questions oftener than you express opinions; and when you speak, offer data and information rather than beliefs and judgments.⁶⁷ Manifest pride is a help to advancement; and "ostentation is a fault in ethics rather than in politics."⁶⁸ Here again one is reminded of Napoleon; Bacon, like the little Corsican, was a

⁶⁴Adv. of L., viii, 2.

⁶⁵Cf. Edward Carpenter's delightful *Iolaus*.

⁶⁶Adv. of L., viii, 2.

⁶⁷Essays "Of Dissimulation" and "Of Discourse."

⁶⁸Adv. of L., viii, 2.

simple man enough within his walls, but outside them he affected a ceremony and display which he thought indispensable to public repute.

So Bacon runs from field to field, pouring the seed of his thought into every science. At the end of his survey he comes to the conclusion that science by itself is not enough: there must be a force and discipline outside the sciences to co-ordinate them and point them to a goal. "There is another great and powerful cause why the sciences have made but little progress, which is this. It is not possible to run a course aright when the goal itself has not been rightly placed."⁶⁹ What science needs is philosophy—the analysis of scientific method, and the co-ordination of scientific purpose; without this, any science must be superficial. "For as no perfect view of a country can be taken from a flat; so it is impossible to discover the remote and deep parts of any science by standing upon the level of the same science, or without ascending to a higher."⁷⁰ He condemns the habit of looking at isolated facts out of their context, without considering the unity of nature; as if, he says, one should carry a small candle about the corners of a room radiant with a central light.

Philosophy, rather than science, is in the long run Bacon's love; it is only philosophy which can give even to a life of turmoil and grief the stately peace that comes of understanding. "Learning conquers or mitigates the fear of death and adverse fortune." He quotes Vergil's great lines:

Felix qui potuit rerum cognoscere causas,
Quique metus omnes, et inexorabile fatum,
Subject pedibus, strepitumque Acherontis avari:

"happy the man who has learned the causes of

⁶⁹Adv. of L., i, 81.

⁷⁰Ibid., i.

things, and has put under his feet all fears, and inexorable fate, and the noisy strife of the hell of greed." It is perhaps the best lesson of philosophy that through it we unlearn the lesson of endless acquisition which an industrial environment so insistently repeats. "Philosophy directs us first to seek the goods of the mind, and the rest will either be supplied, or not much wanted."⁷¹ A bit of wisdom is a joy forever.

Government suffers, precisely like science, for lack of philosophy. Philosophy bears to science the same relationship which statesmanship bears to politics: movement guided by total knowledge and perspective, as against aimless and individual seeking. Just as the pursuit of knowledge becomes scholasticism when divorced from the actual needs of men and life, so the pursuit of politics becomes a destructive bedlam when divorced from science and philosophy. "It is wrong to trust the natural body to empirics, who commonly have a few receipts whereon they rely, but who know neither the cause of the disease, nor the constitution of patients, nor the danger of accidents, nor the true methods of cure. And so it must needs be dangerous to have the civil body of states managed by empirical statesmen, unless well mixed with others who are grounded in learning.... Though he might be thought partial to his profession who said, 'States would then be happy, when either kings were philosophers or philosophers kings,' yet so much is verified by experience, that the best times have happened under wise and learned princes."⁷² And he refers again to the great emperors who ruled Rome after Domitian and before Commodus.

So Bacon, like Plato and us all, exalted his

⁷¹Adv. of L., viii, 2.

⁷²Ibid., i.

hobby, and offered it as the salvation of man. But he recognized, much more clearly than Plato (and the distinction announces the modern age), the necessity of specialist science, and of soldiers and armies of specialist research. No one mind, not even Bacon's, could cover the whole field, though he should look from Pisgah's top itself. He knew he needed help, and keenly felt his loneliness in the mountain-air of his unaided enterprise. "What comrades have you in your work?" he asks a friend. "As for me, I am in the completest solitude."⁷³ He dreams of scientists co-ordinated in specialization by constant communion and co-operation, and by some great organization holding them together to a goal. "Consider what may be expected from men abounding in leisure, and from association of labors, and from successions of ages; the rather because it is not a way over which only one man can pass at a time (as is the case with that of reasoning), but within which the labors and industries of men (especially as regards the collecting of experience) may with the best effort be collected and distributed, and then combined. For then only will men begin to know their strength when, instead of great numbers doing all the same things, one shall take charge of one thing, and another of another."⁷⁴ Science, which is the organization of knowledge, must itself be organized.

And this organization must be international; let it pass freely over the frontiers, and it may make Europe intellectually one. "The next want I discover is the little sympathy and correspondence which exists between colleges and universities, as well throughout Europe as in the same

⁷³In Nichol, ii, 4.

⁷⁴Nov. Org., i, 113.

state and kingdom."⁷⁵ Let all these universities allot subjects and problems among themselves, and co-operate both in research and in publication. So organized and correlated, the universities might be deemed worthy of such royal support as would make them what they shall be in Utopia—centers of impartial learning ruling the world. Bacon notes "the mean salaries apportioned to public lectureships, whether in the sciences or the arts";⁷⁶ and he feels that this will continue till governments take over the great tasks of education. "The wisdom of the ancientest and best times always complained that states were too busy with laws, and too remiss in point of education."⁷⁷ His great dream is the socialization of science for the conquest of nature and the enlargement of the power of man.

And so he appeals to James I, showering upon him the flattery which he knew his Royal Highness loved to sip. James was a scholar as well as a monarch, prouder of his pen than of his scepter or his sword; something might be expected of so literary and erudite a king. Bacon tells James that the plans he has sketched are "*indeed opera basilica*,"—kingly works—"towards which the endeavors of one man can be but as an image on a cross-road, which points out the way but cannot tread it." Certainly these royal undertakings will involve expense; but "as the secretaries and spies of princes and states bring in bills for intelligence, so you must allow the spies and intelligencers of nature to bring in their bills if you would not be ignorant of many things worthy to be known. And if Alexander placed so large a treasure at Aristotle's command for the support of hunters,

⁷⁵ *Nov. Org.*, i, 113.

⁷⁶ *Adv. of L.*, ii, 1.

⁷⁷ *Adv. of L.*, i.

fowlers, fishers, and the like, in much more need do they stand of this beneficence who unfold the labyrinths of nature."⁷⁸ With such royal aid the Great Reconstruction can be completed in a few years; without it the task will require generations.

What is refreshingly new in Bacon is the magnificent assurance with which he predicts the conquest of nature by man: "I stake all on the victory of art over nature in the race." That which men have done is "but an earnest of the things they shall do." But why this great hope? Had not men been seeking truth, and exploring the paths of science, these two thousand years? Why should one hope now for such great success where so long a time had given so modest a result?—Yes, Bacon answers; but what if the methods men have used have been wrong and useless? What if the road has been lost, and research has gone into by-paths ending in the air? We need a ruthless revolution in our methods of research and thought, in our system of science and logic; we need a new *Organon*,⁷⁹ better than Aristotle's, fit for this larger world.

And so Bacon offers us his supreme book.

2. THE NEW ORGANON

"Bacon's greatest performance," says his bitterest critic, "is the first book of the *Novum Organum*."⁸⁰ Never did a man put more life into logic, making induction an epic adventure and a conquest. If one must study logic, let him begin with this book. "This part of human philosophy which regards logic is disagreeable

⁷⁸Adv. of L., ii, 1.

⁷⁹Referring to the "Organon," or collected logical works of Aristotle.

⁸⁰Macaulay, *op. cit.*, p. 92.

to the taste of many, as appearing to them no other than a net, and a snare of thorny subtlety. . . . But if we would rate things according to their real worth, the rational sciences are the keys to all the rest.”⁸¹

Philosophy has been barren so long, says Bacon, because she needed a new method to make her fertile. The great mistake of the Greek philosophers was that they spent so much time in theory, so little in observation. But thought should be the aide of observation, not its substitute. “Man,” says the first aphorism of the *Novum Organum*, as if flinging a challenge to all metaphysics,—“Man, as the minister and interpreter of nature, does and understands as much as his observations on the order of nature... permits him; and neither knows nor is capable of more.” The predecessors of Socrates were in this matter sounder than his followers; Democritus, in particular, had a nose for facts, rather than an eye for the clouds. No wonder that philosophy has advanced so little since Aristotle’s day; it has been using Aristotle’s methods. “To go beyond Aristotle by the light of Aristotle is to think that a borrowed light can increase the original light from which it is taken.”⁸² Now, after two thousand years of logic-chopping with the machinery invented by Aristotle, philosophy has fallen so low that none will do her reverence. All these medieval theories, theorems and disputations must be cast out and forgotten; to renew herself philosophy must begin again with a clean slate and with a cleansed mind.

The first step, therefore, is the Expurgation of the Intellect. We must become as little children, innocent of isms and abstractions, washed

⁸¹Adv. of L., v, 1.

⁸²Valerius Terminus.

clear of prejudices and preconceptions. We must destroy the Idols of the mind.

An idol, as Bacon uses the word (reflecting perhaps the Protestant rejection of image-worship), is a picture taken for a reality, a thought mistaken for a thing. All errors come under this head; and the first problem of logic is to trace and dam the sources of these errors. Bacon proceeds now to a justly famous analysis of fallacies; "no man," said Condillac, "has better known than Bacon the causes of human error."

These errors are, first, *Idols of the Tribe*.—fallacies natural to humanity in general. "For man's sense is falsely asserted" (by Protagoras' "Man is the measure of all things") "to be the standard of things: on the contrary, all the perceptions, both of the senses and the mind, bear reference to man and not to the universe; and the human mind resembles those uneven mirrors which impart their own properties to different objects . . . and distort and disfigure them."⁸³ Our thoughts are pictures rather of ourselves than of their objects. For example, "the human understanding, from its peculiar nature, easily supposes a greater degree of order and regularity in things than it really finds. . . . Hence the fiction that all celestial bodies move in perfect circles."⁸⁴ Again, the human understanding, when any proposition has been once laid down (either from general admission and belief, or from the pleasure it affords), forces everything else to add fresh support and confirmation: and although most cogent and abundant instances may exist to the contrary, yet either does not observe, or despises them, or gets rid of and rejects

⁸³ *Nov. Org.*, i, 41.

⁸⁴ *Ibid.*, i, 45.

them by some distinction, with violent and injurious prejudice, rather than sacrifice the authority of its first conclusions. It was well answered by him who was shown in a temple the votive tablets suspended by such as had escaped the peril of shipwreck, and was pressed as to whether he would then recognize the power of the gods. . . . 'But where are the portraits of those that have perished in spite of their vows?' All superstition is much the same, whether it be that of astrology, dreams, omens, retributive judgment, or the like, in all of which the deluded believers observe events which are fulfilled, but neglect and pass over their failure, though it be much more common."⁸⁵

"Having first determined the question according to his will, he *then* resorts to experience; and bending her into conformity with his placets, leads her about like a captive in a procession."⁸⁶ In short, "the human understanding is no dry light, but receives an infusion from the will and affections, whence proceed sciences which may be called 'sciences as one would.' . . . For what a man had rather were true, he more readily believes."⁸⁷ Is it not so?

Bacon gives at this point a word of golden counsel. "In general let every student of nature take this as a rule—that whatever his mind seizes and dwells upon with peculiar satisfaction, is to be held in suspicion; and that so much the more care is to be taken, in dealing with such questions, to keep the understanding even and clear."⁸⁸ "The understanding must not be allowed to jump and fly from

⁸⁵ *Nov. Org.*, i, 46.

⁸⁶ *Ibid.*, i, 63.

⁸⁷ *Ibid.*, i, 49.

⁸⁸ *Ibid.*, i, 58.

particulars to remote axioms and of almost the highest generality; . . . it must not be supplied with wings, but rather hung with weights to keep it from leaping and flying."⁸⁹ The imagination may be the greatest enemy of the intellect, whereas it should be only its tentative and experiment.

A second class of errors Bacon calls *Idols of the Cave*—errors peculiar to the individual man. "For everyone . . . has a cave or den of his own, which refracts and discolors the light of nature"; this is his character as formed by nature and nurture, and by his mood or condition of body and mind. Some minds, e. g., are constitutionally analytic, and see differences everywhere; others are constitutionally synthetic, and see resemblances; so we have the scientist and the painter on the one hand, and on the other hand the poet and the philosopher. Again, "some dispositions evince an unbounded admiration for antiquity, others eagerly embrace novelty; only a few can preserve the just medium, and neither tear up what the ancients have correctly established, nor despise the just innovations of the moderns."⁹⁰ Truth knows no parties.

Thirdly, *Idols of the Market-place*, arising "from the commerce and association of men with one another. For men converse by means of language; but words are imposed according to the understanding of the crowd; and there arises from a bad and inapt formation of words, a wonderful obstruction to the mind."⁹¹ Philosophers deal out infinites with the careless assurance of grammarians handling infinitives; and yet does any man know what this

⁸⁹ *Nov. Org.*, i, 104.

⁹⁰ *Ibid.*, i, 56.

⁹¹ *Ibid.*, i, 43.

"infinite" is, or whether it has even taken the precaution of existing? Philosophers talk about "first cause uncaused," or "first mover unmoved"; but are not these again fig-leaf phrases used to cover naked ignorance, and perhaps indicative of a guilty conscience in the user? Every honest and clear head knows that no cause can be causeless, nor any mover unmoved. Perhaps the greatest reconstruction in philosophy would be simply this—that we should stop lying to ourselves.

"Lastly, there are idols which have migrated into men's minds from the various dogmas of philosophers, and also from wrong laws of demonstration. These I call *Idols of the Theater*, because in my judgment all the received systems of philosophy are but so many stage-plays, representing worlds of their own creation after an unreal and scenic fashion.... And in the plays of this philosophic theater you may observe the same thing which is found in the theater of the poets,—that stories invented for the stage are more compact and elegant, and more as we would wish them to be, than true stories out of history."⁹² The world as Plato describes it is merely a world constructed by Plato, and pictures Plato rather than the world.

We shall never get far along towards the truth if these idols are still to trip us up, even the best of us, at every turn. We need new modes of reasoning, new tools for the understanding. "And as the immense regions of the West Indies had never been discovered, if the use of the compass had not first been known, it is no wonder that the discovery and advancement of arts hath made no greater

⁹²Nov. Org., i, 44.

progress, when the art of inventing and discovering of the sciences remains hitherto unknown."⁹³ "And surely it would be disgraceful if, while the regions of the material globe . . . have been in our times laid widely open and revealed, the intellectual globe should remain shut up within the narrow limits of old discoveries."⁹⁴

Ultimately, our troubles are due to dogma and deduction; we find no new truth because we take some venerable but questionable proposition as an indubitable starting-point, and never think of putting this assumption itself to the test of observation or experiment. But "if a man will begin with certainties, he shall end in doubts; but if he will be content to begin in doubts he shall end in certainties" (alas, it is not quite inevitable). Here is a note common in the youth of modern philosophy, part of its declaration of independence; Descartes too would presently talk of the necessity of "methodic doubt" as the cobweb-clearing pre-requisite of honest thought.

Bacon proceeds to give an admirable description of the scientific method of inquiry. "There remains *simple experience*; which, if taken as it comes, is called accident" ("empirical"), "if sought for, experiment. . . . The true method of experience first lights the candle" (hypothesis), "and then by means of the candle shows the way" (arranges and delimits the experiment); "commencing as it does with experience duly ordered and digested, not bungling nor erratic, and from it educating axioms, and from established axioms

⁹³Adv. of L., v, 2.

⁹⁴Nov. Org., i, 84.

again new experiments.”⁹⁵ (We have here—as again in a later passage⁹⁶ which speaks of the results of initial experiments as a “first vintage” to guide further research—an explicit, though perhaps inadequate, recognition of that need for hypothesis, experiment and deduction which some of Bacon’s critics suppose him to have entirely overlooked.) We must go to nature instead of to books and traditions and authorities; we must “put nature on the rack and compel her to bear witness” even against herself, so that we may control her to our ends. We must gather together from every quarter a “natural history” of the world, built by the united research of Europe’s scientists. We must have induction.

But induction does not mean “simple enumeration” of all the data; conceivably, this might be endless, and useless; no mass of material can by itself make science. This would be like “chasing a quarry over an open country”; we must narrow and enclose our field in order to capture our prey. The method of induction must include a technique for the classification of data and the elimination of hypotheses; so that by the progressive canceling of possible explanations one only shall at last remain. Perhaps the most useful item in this technique is the “table of more or less,” which lists instances in which two qualities or conditions increase or decrease together, and so reveals, presumably, a causal relation between the simultaneously varying phenomena. So Bacon, asking, What is heat?—seeks for some factor that increases with the increase of heat, and decreases with its decrease; he finds, after

⁹⁵ *Nov. Org.*, i. 82.

⁹⁶ *Ibid.*, ii, 20.

long analysis, an exact correlation between heat and motion; and his conclusion that heat is a form of motion constitutes one of his few specific contributions to natural science.

By this insistent accumulation and analysis of data we come, in Bacon's phrase, to the *form* of the phenomenon which we study,—to its secret nature and its inner essence. The theory of forms in Bacon is very much like the theory of ideas in Plato: a metaphysics of science. "When we speak of forms we mean nothing else than those laws and regulations of simple action which arrange and constitute any simple nature.... The form of heat or the form of light, therefore, means no more than the law of heat or the law of light."⁹⁷ (In a similar strain Spinoza was to say that the law of the circle is its *substance*. "For although nothing exists in nature except individual bodies exhibiting clear individual effects according to particular laws; yet, in each branch of learning, those very laws—their investigation, discovery and development—are the foundation both of theory and of practice."⁹⁸ Of theory and of practice; one without the other is **useless** and **perilous**; knowledge that does not generate achievement is a pale and bloodless thing, unworthy of mankind. We strive to learn the forms of things not for the sake of the forms but because by knowing the forms, the laws, we may remake things in the image of our desire. So we study mathematics in order to reckon quantities and build bridges; we study psychology in order to find our way in the jungle of society. When science has sufficiently ferreted out the forms of things, the world

⁹⁷ *Nov. Org.*, ii, 13, 17.

⁹⁸ *Nov. Org.*, ii, 2.

will be merely the raw material of whatever utopia man may decide to make.

3. THE UTOPIA OF SCIENCE

To perfect science so, and then to perfect social order by putting science in control, would itself be utopia enough. Such is the world described for us in Bacon's brief fragment and last work, *The New Atlantis*, published two years before his death. Wells thinks it Bacon's "greatest service to science"⁹⁹ to have drawn for us, even so sketchily, the picture of a world in which at last science has its proper place as the master of things; it was a royal act of imagination by which for three centuries one goal has been held in view by the great army of warriors in the battle of knowledge and invention against poverty and ignorance. Here in these few pages we have the essence and the "form" of Francis Bacon, the law of his being and his life, the secret and continuous aspiration of his soul.

Plato in the *Timaeus*¹⁰⁰ has told of the old legend of Atlantis, the sunken continent in the Western seas. Bacon and others identified the new America of Columbus and Cabot with this old Atlantis; the great continent had not sunk after all, but only men's courage to migrate the sea. Since this old Atlantis was now known, and seemed inhabited by a race vigorous enough, but not quite like the brilliant Utopians of Bacon's fancy, he conceived of a new Atlantis, an isle in that distant Pacific which only Drake and Magellan had traversed, an isle distant enough from Europe and from knowledge to give generous scope to the Utopian imagination.

⁹⁹ *Outline of History*, ch. xxxv, sect. 6.

¹⁰⁰ Sect. 25.

The story begins in the most artfully artless way, like the great tales of Defoe and Swift. "We sailed from Peru (where we had continued for the space of one whole year), for China and Japan by the South Sea." Came a great calm, in which the ships for weeks lay quietly on the boundless ocean like a speck upon a mirror, while the provisions of the adventurers ebbed away. And then resistless winds that drove the vessel pitilessly north and north and north, out of the island-dotted south into an endless wilderness of sea. The rations were reduced, and reduced again, and again reduced; and disease took hold of the crew. At last, when they had resigned themselves to death, they saw, almost unbelieving, a fair island looming up under the sky. On the shore, as their vessel neared it, they saw not savages, but men simply and yet beautifully clothed, clean, and manifestly of developed intelligence. They were permitted to land, but were told that the island government allowed no strangers to remain. But because some of the crew were sick, they might all stay till these should be well again.

During the weeks of convalescence the wanderers unraveled, day by day, the mystery of the New Atlantis. "There reigned in this island about nineteen hundred years ago," one of the inhabitants tells them, "a King whose memory above all others we most adore. . . . His name was Solamona, and we esteem him as the Law-giver of our nation. This King had a large heart . . . and was wholly bent to make his kingdom and people happy."¹⁰¹ Among the excellent acts of this King one above all hath the pre-eminence. It was the creation and

¹⁰¹*The New Atlantis*, Cambridge University Press, 1900; p. 20.

institution of the Order, or Society, which is called Solomon's House; the noblest foundation, as we think, that was ever upon the earth; and the lantherne of this kingdom.¹⁰²

There follows a description of Solomon's House, too complicated for a quoted abstract, but eloquent enough to draw from the hostile Macaulay the judgment that "there is not to be found in any human composition a passage more eminently distinguished by profound and serene wisdom."¹⁰³ Solomon's House takes the place, in the New Atlantis, of the Houses of Parliament in London; it is the home of the island government. But there are no politicians here, no insolent "elected persons," no "national palaver," as Carlyle would say; no parties, caucuses, primaries, conventions, campaigns, buttons, lithographs, editorials, speeches, lies, and elections; the idea of filling public office by such dramatic methods seems never to have entered the heads of these Atlantans. But the road to the heights of scientific repute is open to all, and only those who have traveled the road sit in the councils of the state. It is a government of the people and for the people by the selected best of the people; a government by technicians, architects, astronomers, geologists, biologists, physicians, chemists, economists, sociologists, psychologists and philosophers. Complicated enough; but think of a government without politicians!

Indeed there is very little government in the New Atlantis; these governors are engaged rather in controlling nature than in ruling man. "The End of Our Foundation is the Knowledge of Causes and secret motions of things; and the enlarging of the bounds of human em-

¹⁰²*New Atlantis*, p. 22.

¹⁰³*Ibid.*, p. xxv.

pire, to the effecting of all things possible."¹⁰⁴ This is the key-sentence of the book, and of Francis Bacon. We find the governors engaged in such undignified tasks as studying the stars, arranging to utilize for industry the power of falling water, developing gases for the cure of various ailments,¹⁰⁵ experimenting on animals for surgical knowledge, growing new varieties of plants and animals by cross-breeding, etc. "We imitate the flights of birds; we have some degree of flying in the air. We have ships and boats for going under water." There is foreign trade, but of an unusual sort; the island produces what it consumes, and consumes what it produces; it does not go to war for foreign markets. "We maintain a trade, not of gold, silver, or jewels, nor for silks, nor for spices, nor for any other commodity or matter; but only for God's first creature, which was light; to have light of the growth of all parts of the world."¹⁰⁶ These "Merchants of Light" are members of Solomon's House who are sent abroad every twelve years to live among foreign peoples of every quarter of the civilized globe; to learn their language and study their sciences and industries and literatures; and to return, at the end of the twelve years, to report their findings to the leaders of Solomon's House; while their places abroad are taken by a new group of scientific explorers. In this way the best of all the world comes soon to the New Atlantis.

Brief as the picture is, we see in it again the

¹⁰⁴ *New Atlantis*, p. 34.

¹⁰⁵ Cf. The New York Times of May 2, 1923, for a report of War Department chemists on the use of war gases to cure diseases.

¹⁰⁶ *New Atlantis*, p. 24.

outline of every philosopher's utopia—a people guided in peace and modest plenty by their wisest men. The dream of every thinker is to replace the politician by the scientist; why does it remain only a dream after so many incarnations? Is it because the thinker is too dreamily intellectual to go out into the arena of affairs and build his concept into reality? Is it because the hard ambition of the narrowly acquisitive soul is forever destined to overcome the gentle and scrupulous aspirations of philosophers and saints? Or is it that science is not yet grown to maturity and conscious power? —that only in our day do physicians and chemists and technicians begin to see that the rising role of science in industry and war gives them a pivotal position in social strategy, and points to the day when their organized strength will persuade the world to call them to leadership? Perhaps science has not yet merited the mastery of the world; and perhaps in a little while it will.

V. CRITICISM

And now how shall we appraise this philosophy of Francis Bacon's?

Is there anything new in it? Macaulay thinks that induction as described by Bacon is a very old-fashioned affair, over which there is no need of raising any commotion, much less a monument. "Induction has been practiced from morning till night by every human being since the world began. The man who infers that mince pies disagreed with him because he was ill when he ate them, well when he ate them not, most ill when he ate most and least ill when he ate least, has employed, unconsciously but sufficiently, all the tables of the *Novum Organum*."¹⁰⁷ But John Smith hardly handles

¹⁰⁷Op. cit., p. 471.

his "table of more or less" so accurately, and more probably will continue his mince-pies despite the seismic disturbances of his lower strata. And even were John Smith so wise, it would not shear Bacon of his merit; for what does logic do but formulate the experience and methods of the wise?—what does any discipline do but try by rules to turn the art of a few into a science teachable to all?

But is the formulation Bacon's own? Is not the Socratic method inductive? Is not Aristotle's biology inductive? Did not Roger Bacon practice as well as preach the inductive method which Francis Bacon merely preached? Did not Galileo formulate better the procedure that science has actually used? True of Roger Bacon, less true of Galileo, less true yet of Aristotle, least true of Socrates. Galileo formulated the aim rather than the method of science, holding up before its followers the goal of mathematical and quantitative formulation of all experience and relationships; Aristotle practiced induction when there was nothing else for him to do, and where the material did not lend itself to his penchant for the deduction of specific conclusions from magnificently general assumptions; and Socrates did not so much practice induction—the gathering of data—as analysis—the definition and discrimination of words and ideas.

Bacon makes no claim to parthenogenetic originality; like Shakespeare he takes with a lordly hand, and with the same excuse, that he adorns whatever he touches. Every man has his sources, as every organism has its food; what is his is the way in which he digests them and turns them into flesh and blood. As Rawley puts it, Bacon "contemned no man's observations but would light his torch at every man's

candle."¹⁰⁸ But Bacon acknowledges these debts: he refers to "that useful method of Hippocrates,"¹⁰⁹—so sending us at once to the real source of inductive logic among the Greeks; and "Plato," he writes (where less accurately we write "Socrates"), "giveth good example of inquiry by induction and view of particulars; though in such a wandering manner as is of no force or fruit."¹¹⁰ He would have disdained to dispute his obligations to these predecessors; and we should disdain to exaggerate them.

But then again, is the Baconian method correct? Is it the method most fruitfully used in modern science? No: generally, science has used, with best result, not the accumulation of data ("natural history") and their manipulation by the complicated tables of the *Novum Organum*; its method has been the simpler one of hypothesis, deduction and experiment. So Darwin, reading Malthus' *Essay on Population*, conceived the idea of applying to all organisms the Malthusian hypothesis that population tends to increase faster than the means of subsistence; deducted from this hypothesis the probable conclusion that the pressure of population on the food-supply results in a struggle for existence in which the fittest survive, and by which in each generation every species is changed into closer adaptation to its environment; and finally (having by hypothesis and deduction limited his problem and his field of observation) turned to "the unwithered face of nature" and made for twenty years a patient inductive examination of the facts. Again, Einstein conceived, or took from Newton, the hypothesis that light travels in curved, not

¹⁰⁸Quoted by J. M. Robertson, Introduction to *The Philosophical Works of Francis Bacon*; p. 7.

¹⁰⁹Adv. of L, iv, 2.

¹¹⁰Fil. Lab., ad fin.

straight lines; deduced from it the conclusion that a star appearing to be (on the straight-line theory) in a certain position in the heavens is really a little to one side of that position; and he invited experiment and observation to test the conclusion. Obviously the function of hypothesis and imagination is greater than Bacon supposed; and the procedure of science is more direct and circumscribed than in the Baconian scheme. Bacon himself anticipated the superannuation of his method; the actual practice of science would discover better modes of investigation than could be worked out in the interludes of statesmanship. "These things require some ages for the ripening of them."

Even a lover of the Baconian spirit must concede, too, that the great Chancellor, while laying down the law for science, failed to keep abreast of the science of his time. He rejected Copernicus and ignored Kepler and Tycho Brache; he deprecated Gilbert and seemed unaware of Harvey. In truth, he loved discourse better than research; or perhaps he had no time for toilsome investigations. Such work as he did in philosophy and science was left in fragments and chaos at his death; full of repetitions, contradictions, aspirations, and introductions. *Ars longa, vita brevis*—art is long and time is fleeting: this is the tragedy of every great soul.

To assign to so overworked a man, whose reconstruction of philosophy had to be crowded into the crevices of a harassed and a burdened political career, the vast and complicated creations of Shakespeare, is to waste the time of students with the parlor controversies of idle theorists. Shakespeare lacks just that which distinguishes the lordly Chancellor—erudition and philosophy. Shakespeare has an impressive smattering of many sciences, and a mastery of none; in all of them he speaks with the

eloquence of an amateur. He accepts astrology: "This huge state . . . whereon the stars in secret influence comment."ⁱⁱⁱ He is forever making mistakes which the learned Bacon could not possibly have made: his Hector quotes Aristotle and his Coriolanus alludes to Cato; he gives to Bohemia a sea-coast which is never enjoyed; he supposes the Lupercalia to be a hill; and he understands Caesar almost as profoundly as Caesar is understood by H. G. Wells. He makes countless references to his early life and his matrimonial tribulations. He perpetrates vulgarities, obscenities and puns natural enough in the gentle roisterer who could not quite outlive the Stratford rioter and the butcher's son, but hardly to be expected in the cold and calm philosopher. Carlyle calls Shakespeare the greatest of intellects; but he was rather the greatest of imaginations, and the keenest eye. He is an inescapable psychologist, but he is not a philosopher: he has no structure of thought co-ordinated by a purpose for his own life and for mankind. He is immersed in love and its problems, and thinks of philosophy, through Montaigne's phrases, only when his heart is broken. Otherwise he accepts the world blithely enough; he is not consumed with the reconstructive vision that ennobled Plato, or Nietzsche, or Bacon.

Now the greatness and the weakness of Bacon lay precisely in his passion for unity, his desire to spread the wings of his co-ordinating genius over a hundred sciences. He aspired to be like Plato, "a man of sublime genius, who took a view of everything as from a lofty rock. He broke down under the weight of the tasks he had laid upon himself; he failed forgivably because he undertook so much. He

ⁱⁱⁱSonnet xv.

could not enter the promised land of science, but as Cowley's epitaph expressed it, he could at least stand upon its border and point out its fair features in the distance.

His achievement was not the less great because it was indirect. His philosophical works, though little read now, "moved the intellects which moved the world."¹¹² He made himself the eloquent voice of the optimism and resolution of the Renaissance. Never was any man so great a stimulus to other thinkers. King James, it is true, refused to accept his suggestion for the support of science, and said of the *Novum Organum* that "it was like the peace of God, which passeth all understanding." But better men, in 1662, founding that Royal Society which was to become the greatest association of scientists in the world, named Bacon as their model and inspiration; they hoped that this organization of English research would lead the way toward that Europe-wide association which the *Advancement of Learning* had taught them to desire. And when the great minds of the French Enlightenment undertook that masterpiece of intellectual enterprise, the *Encyclopedie*, they dedicated it to Francis Bacon. "If," said Diderot in the Prospectus, "we have come of it successfully, we shall owe most to the Chancellor Bacon, who threw out the plan of an universal dictionary of sciences and arts, at a time when, so to say, neither arts nor sciences existed. That extraordinary genius, when it was impossible to write a history of what was known, wrote one of what it was necessary to learn." D'Alembert called Bacon "the greatest, the most universal, and the most eloquent of philosophers." The Convention pub-

¹¹² Macaulay, p. 941.

lished the works of Bacon at the expense of the state.¹¹³ The whole tenor and career of British thought have followed the philosophy of Bacon. His tendency to conceive the world in Democritean mechanical terms gave to his secretary, Hobbes, the starting-point for a thorough-going materialism; his inductive method gave to Locke the idea of an empirical psychology, bound by observation and freed from theology and metaphysics; and his emphasis on "commodities" and "fruits" found formulation in Bentham's identification of the useful and the good.

Wherever the spirit of control has overcome the spirit of resignation, Bacon's influence has been felt. He is the voice of all those Europeans who have changed a continent from a forest into a treasure-land of art and science, and have made their little peninsula the center of the world. "Men are not animals erect," said Bacon, "but immortal gods." "The Creator has given us souls equal to all the world, and yet satiable not even with a world." Everything is possible to man. Time is young; "the antiquity of time is the youth of the world"; give us some little centuries, and we shall control and remake all things. We shall perhaps at last learn the noblest lesson of all, that man must not fight man, but must make war only on the obstacles that nature offers to the triumph of man. "It will not be amiss," writes Bacon, in one of his finest passages, "to distinguish the three kinds, and as it were grades, of ambition in mankind. The first is of those who desire to extend their power in their native country; which kind is vulgar and degenerate. The second is of those who labor to

¹¹³Nichol, ii, 235.

extend the power of their country and its dominion among men; this certainly has more dignity, but not less covetousness. But if a man endeavor to establish and extend the power and dominion of the human race itself over the universe, his ambition is without doubt both a more wholesome thing and a nobler than the other two."¹¹⁴ It was Bacon's fate to be torn to pieces by these hostile ambitions struggling for his soul.

VI. EPILOGUE

"Men in great place are thrice servants; servants to the sovereign or state, servants of fame, and servants of business; so as they have no freedom, neither in their persons nor in their action, nor in their time. . . . The rising unto place is laborious, and by pains men come to greater pains; and it is sometimes base, and by indignities men come to dignities. The standing is slippery, and the regress is either a downfall or at least an eclipse."¹¹⁵ What a wistful summary of Bacon's epilogue!

"A man's shortcomings," said Goethe, "are taken from his epoch; his virtues and greatness belong to himself." This seems a little unfair to the *Zeitgeist*, but it is exceptionally just in the case of Bacon. Abbott,¹¹⁶ after a painstaking study of the morals prevalent at Elizabeth's court, concludes that all the leading figures, male and female, were disciples of Machiavelli. Roger Ascham described in doggerel the four cardinal virtues in demand at the court of the Queen:

¹¹⁴ *Nov. Org.*, i, 129.

¹¹⁵ *Essay. "Of Great Place."*

¹¹⁶ *Francis Bacon*, ch. i.

Cog, He, flatter and face,
Four ways in Court to win men grace.
If thou be thrall to none of these,
Away, good Piers! Home, John Cheese!

It was one of the customs of those lively days for judges to take "presents" from persons trying cases in their courts. Bacon was not above the age in this matter; and his tendency to keep his expenditure several years in advance of his income forbade him the luxury of scruples. It might have passed unnoticed, except that he had made enemies in Essex's case and by his readiness to sabre foes with his speech. A friend had warned him that "it is too common in every man's mouth in Court that . . . as your tongue hath been a razor to some, so shall theirs be to you."¹¹⁷ But he left the warnings unnoticed. He seemed to be in good favor with the King; he had been made Baron Verulam of Verulam in 1618, and Viscount St. Albans in 1621; and for three years he had been Chancellor.

Then suddenly the blow came. In 1621 a disappointed suitor charged him with taking money for the despatch of a suit; it was no unusual manner, but Bacon knew at once that if his enemies wished to press it they could force his fall. He retired to his home, and awaited developments. When he learned that all his foes were clamoring for his dismissal, he sent in his "confession and humble submission" to the King. James, yielding to pressure from the now victorious Parliament against which Bacon had too persistently defended him, sent him to the Tower. But Bacon was released after two days; and the heavy fine which had been laid

¹¹⁷Francis Bacon, p. 13 note.

upon him was remitted by the King. His pride was not quite broken. "I was the justest judge that was in England these fifty years," he said; "but it was the justest judgment that was in Parliament these two hundred years."

He spent the five years that remained to him in the obscurity and peace of his home, harassed by an unwonted poverty, but solaced by the active pursuit of philosophy. In these five years he wrote his greatest Latin work, *De Augmentis Scientiarum*, published an enlarged edition of the Essays, a fragment called *Sylva Sylvarum* and a *History of Henry VII*. He mourned that he had not sooner abandoned politics and given all his time to literature and science. To the very last moment he was occupied with work, and died, so to speak, on the field of battle. In his essay "Of Death" he had voiced a wish to die "in an earnest pursuit, which is like one wounded in hot blood, who for the time scarce feels the hurt." Like Caesar, he was granted his choice.

In March, 1626, while riding from London to Highgate, and turning over in his mind the question how far flesh might be preserved from putrefaction by being covered with snow, he resolved to put the matter to a test at once. Stopping off at a cottage, he bought a fowl, killed it, and stuffed it with snow. While he was doing this he was seized with chills and weakness; and finding himself too ill to ride back to town, he gave directions that he should be taken to the nearby home of Lord Arundel, where he took to bed. He did not yet resign life; he wrote cheerfully that "the experiment . . . succeeded excellently well." But it was his last. The fitful fever of his varied life had quite consumed him; he was all burnt out now,

too weak to fight the disease that crept up slowly to his heart. He died on the ninth of April, 1626, aged sixty-five.

He had written in his will these proud and characteristic words: "I bequeath my soul to God. . . . My body to be buried obscurely. My name to the next ages and to foreign nations." The ages and the nations have accepted him.

